

# SE MRC College Algebra Content Review

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## Geometric Sequences and Series Section 8.3

### Learning Objectives:

1. Find the common ratio of a geometric sequence.
2. Write terms of a geometric sequence.
3. Use the formula for the general term of a geometric sequence.
4. Use the formula for the sum of the first  $n$  terms of a geometric sequence.
5. Find the value of an annuity.
6. Use the formula for the sum of an infinite geometric series.

2. Write the first five terms of the geometric sequence whose first term is 81, and common ratio is  $\frac{1}{3}$ .

$$a_1 =$$

$$a_2 =$$

$$a_3 =$$

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1. Write the first five terms of the geometric sequence whose first term is 8, and common ratio is 2.

$$a_1 =$$

$$a_4 =$$

$$a_5 =$$

$$a_2 =$$

3. Use the formula for the general term (nth term) of a geometric sequence to find the indicated term of the following sequence with the given first term,  $a_1$ , and common ratio  $r$ .

$$a_3 =$$

*Find  $a_{10}$  when  $a_1 = 6$  and  $r = -4$*

$$a_4 =$$

$$a_5 =$$

$$a_{10} =$$

4. Use the formula for the general term (nth term) of a geometric sequence to find the indicated term of the following sequence with the given first term,  $a_1$ , and common ratio  $r$ .

Find  $a_8$  when  $a_1 = 9,000,000$  and  $r = 0.1$

$$a_8 =$$

5. Write a formula for the nth term of the following geometric sequence. Then use the formula for  $a_n$  to find  $a_5$ , the 5<sup>th</sup> term of the sequence.

4, 12, 36, ...

$$a_n =$$

$$a_5 =$$

6. Write a formula for the general term of the geometric sequence. Then use the formula for  $a_n$  to find  $a_7$ , the seventh term of the sequence.

12, 6, 3,  $\frac{3}{2}$  ...

$$a_n =$$

$$a_7 =$$

7. Find the sum of the first 13 terms of the geometric sequence shown below.

3, 12, 48, 192 ...

8. Use the formula for the sum of the first n terms of a geometric sequence to solve this exercise. Find the sum of the first 13 terms of the following sequence.

$$2, -4, 8, -16, \dots$$

$$S_{13} =$$

9. Find the sum of the infinite geometric series.

$$1 + \frac{1}{9} + \frac{1}{81} + \frac{1}{729} + \dots$$

10. Find the sum of the infinite geometric series.

$$4 - \frac{4}{5} + \frac{4}{25} - \frac{4}{125} + \dots$$

**Answer Key:**

1.	$a_1$	8
	$a_2$	16
	$a_3$	32
	$a_4$	64
	$a_5$	128
2.	$a_1$	81
	$a_2$	27
	$a_3$	9
	$a_4$	3
	$a_5$	1
3.	-1,572,864	
4.	0.9	
5.	$a_n = 4(3)^{n-1}$ $a_5 = 324$	
6.	$a_n = 12\left(\frac{1}{2}\right)^{n-1}$ $a_7 = \frac{3}{16}$	
7.	67,108,863	
8.	5462	
9.	$\frac{9}{8}$	
10.	$\frac{10}{3}$	